

OPERATING MANUAL



MC-7

WORD CLOCK DISTRIBUTION AMPLIFIER & AUDIO CLOCK CONVERTER



WWW.MUTEC-NET.DE

SAFETY INSTRUCTIONS

General instructions

To reduce the risk of fire or electrical shock, do not expose this appliance to rain or moisture, direct sunlight or excessive heat from sources such as radiators or spotlights. No user serviceable parts are inside. Repair and maintenance must be carried out by qualified personnel authorized by MUTECH GmbH! The unit has been designed for operation in a standard domestic environment. Do NOT expose the unit and its accessories to rain, moisture, direct sunlight or excessive heat produced by such heat sources as radiators or spotlights! The free flow of air inside and around the unit must always be ensured.

Initial operation

Prior to the initial operation of the unit, the appliance, its accessories and packaging must be inspected for any signs of physical damage that may have occurred during transit. If the unit has been damaged mechanically or if liquids have been spilled inside the enclosure, the appliance may not be connected to the mains or must be disconnected from the mains immediately! If the unit is damaged, please do NOT return it to MUTECH GmbH, but notify your dealer and the shipping company immediately, otherwise claims for damage or replacement may not be granted.

If the device is left in a low-temperature environment for a long time and then is moved to a room-temperature environment, condensation may occur on the inside and the exterior. To avoid short-circuits and flashovers, be sure to wait one or two hours before putting the device into operation.

Power supply

The device contains a self-adapting wide-range power supply supporting the majority of global standard line voltages within a range of 90...250 V, with no need for making adjustments. Make sure that your line-voltage source provides a supply voltage within the specified range. In addition, make sure that the device is properly grounded via the local electric installation.

Please use the enclosed power cord (see packaging) to connect the unit to the mains. Switch the unit off before you attempt to connect it to the mains. Connect the power cord to the unit, then to a standard 3-pin mains outlet. To draw the power cord, never pull on the cable but on the mains plug!

The unit must be grounded during operation!

For information on the power-inlet wiring, refer to the »Wiring of connectors« section in the appendix. Disconnect the device from the mains when not using it for an extended period!



This symbol, a flash of lightning inside a triangle, alerts you to the presence of uninsulated dangerous voltage inside the enclosure - voltage that may be sufficient to constitute a risk of shock.



This symbol, an exclamation mark inside a triangle, alerts you to important operating or safety instructions in this manual.

Declaration of Conformity

We herewith confirm that the product complies with the European Commission's standards on electromagnetic compatibility.

Interference emission: EN 50081-1, 1992
Resistance to interference: EN 50082-1, 1992

Presupposed as operation condition is that all clock outputs are connected with high-quality and good shielded BNC 75 ohms cable.



WARRANTY REGULATIONS

§1 Warranty

MUTECH GmbH warrants the flawless performance of this product to the original buyer for a period of two (2) years from the date of purchase. If any failure occurs within the specified warranty period that is caused by defects in material and/or workmanship, MUTECH GmbH shall either repair or replace the product free of charge within 90 days. The purchaser is not entitled to claim an inspection of the device free of charge during the warranty period. If the warranty claim proves to be justified, the product will be returned freight prepaid by MUTECH GmbH within Germany. Outside Germany, the product will be returned with the additional international freight charges payable by the customer. Warranty claims other than those indicated above are expressly excluded.

§2 Warranty transferability

This warranty is extended exclusively to the original buyer who bought the product from a MUTECH GmbH specialized dealer or distributor, and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, distributor, etc.) shall be entitled to give any warranty promise on behalf of MUTECH GmbH.

§3 Warranty regulations

The return of the completed registration card, or online registration on one of the websites specified below, is a condition of warranty. Failing to register the device before returning it for repair will void the extended warranty.

- The serial number on the returned device must match the one stated on the registration card or entered during online registration. Otherwise, the device will be returned to the sender at the sender's expense.
- Any returned device must be accompanied by a detailed error description and a copy of the original sales receipt issued by a MUTECH dealer or distributor.
- The device must be returned free of shipping expenses and in the original package, if possible; otherwise, the sender has to provide comparably protective packaging.
- The sender is fully responsible for any damage or loss of the product when shipping it to MUTECH GmbH.

§4 Limitation of warranty

Damages caused by the following conditions are not covered by this warranty:

- Damages caused by every kind of normal wear and tear (e.g. displays, LEDs, potentiometers, faders, switches, buttons, connecting elements, printed labels, cover glasses, cover prints, and similar parts).
- Functional failure of the product caused by improper installation (please observe CMOS components handling instructions!), neglect or misuse of the product, e.g. failure to operate the unit in compliance with the instructions given in the user or service manuals.
- Damage caused by any form of external mechanical impact or modification.
- Damage caused by the user's failure to connect and operate the unit in compliance with local safety regulations.
- Damage caused by force majeure (fire, explosion, flood, lightning, war, vandalism, etc.).
- Consequential damages or defects in products from other manufacturers as well as any costs resulting from a loss of production.

Repairs carried out by personnel which is not authorized from MUTECH GmbH will void the warranty. Adaptations and modifications to the device made with regard to national, technical, or safety regulations in a country or of the customer do not constitute a warranty claim and should be set with MUTECH GmbH in advance.

§5 Repairs

To obtain warranty service, the buyer must call or write to MUTECH GmbH before returning the unit. All inquiries must be accompanied by a description of the problem and the original buyer's invoice. Devices shipped to MUTECH GmbH for repair without prior notice will be returned to the sender at the sender's expense. In case of a functional failure please contact:

MUTECH Gesellschaft fuer Systementwicklung und Komponentenvertrieb mbH
Siekeweg 6/8 • 12309 Berlin • Germany • Fon 030-746880-0 • Fax 030-746880-99 • Tecsupport@MUTECH-net.de • www.MUTECH-net.de

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Peripheral MUTECH Products

Reference Clocks and Master Clocks for Synchronization:

- **iCLOCK + iCLOCKdp**
iCLOCK and iCLOCKdp are synchronizable, high-precision clock generators which are designed to be the reference in digital audio and video studios as well as broadcast and television stations. For further details please visit:
www.iCLOCK-NET.de
- **MC-3**
The MC-3 SMART CLOCK is an universal digital audio master clock generator. The unit provides different high-stable and Ultra low-jitter clock signals for synchronization of various digital audio devices.
- **MC-3.1**
The MC-3.1 SMART CLOCK SD is an universal digital audio and SD video sync master clock generator. The unit provides different high-stable clock signals for simultaneous synchronization of digital audio and SD video devices.
- **MC-3.2**
The MC-3.2 SMART CLOCK HD is an universal digital audio and SD/HD video sync master clock generator. The unit provides different high-stable clock signals for simultaneous synchronization of digital audio and SD/HD video devices.

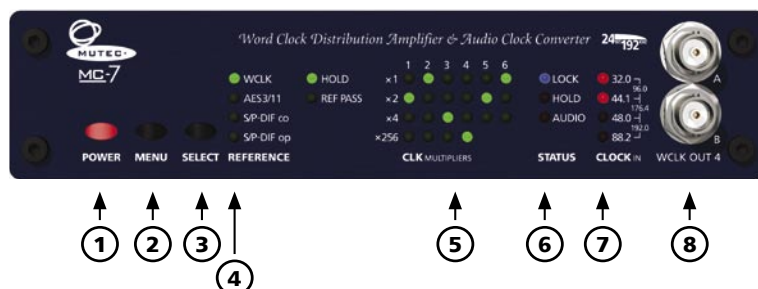
Format and Sampling Rate Converters with internal Master Clock:

- **MC-4**
The MC-4 is a high-performance digital audio multichannel format and sampling rate converter for ADAT™, AES3 and S/P-DIF
- **MC-6**
The MC-6 is a high-performance digital audio dual channel format converter for AES3, AES3id and S/P-DIF.

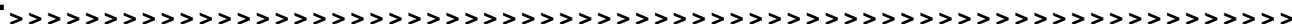
Cables for Digital Audio:

- Optical cables in different lengths from 0.5 m to 20 m for ADAT™ transfers.

For all peripheral products please have a look on our website:
www.MUTECH-NET.de !







INSTALLATION

Content of the Box

The unit was packed carefully. Nevertheless we recommend to check the content directly after opening the package:

- 1 x MC-7
- 1 x Power cable
- 4 x Rubber feet
- 1 x Manual
- 1 x Registration card

Placing the Device

The unit should be set up as closely as possible to the devices to which it will be connected, so as to avoid excessive cable lengths. Use the 4 rubber feet enclosed with the appliance and stick them symmetrically on the bottom side of the unit to protect the enclosure and supporting surface from being damaged.

The device can be mounted into a standard 19" rack and will require 1 unit. In this case, the rubber feet cannot be attached. Install the device so that one unit of rack space is left free both above and below the device to allow for sufficient ventilation! The mounting depth including the terminals is 160 mm/6.7". Another 60 mm/2.4" should be added for the required cables.

Additional slide-in rails on the rack inside are recommended for safe installation. This will also avoid long-term mechanical deformation of the housing.

Wiring the Word Clock interfaces

To allow for the synchronization of signals, the interfaces of all devices involved must be properly connected to each other, so as to ensure a logical signal flow. Always be sure to connect the Word Clock output of the MC-4 to the corresponding input of the device you wish to synchronize. Cable lengths should be kept as short as possible to minimize signal losses and/or interferences!

For the transmission of Word Clock signals electrical, unsymmetrical cables with a resistance of 75Ω and BNC connectors on both ends are used. Typically, such cables are marked »RG-59U, RG59B/U«.

Additionally, you should make sure that the Word Clock inputs to be connected to the MC-7's outputs have a 75Ω terminating resistor! Most Word Clock inputs allow for enabling/disabling the termination with a so-called »termination-switch«, which may be located on the outside or inside of the device.

For devices which have no termination of the Word Clock input, e.g. RME Hammerfall with Word Clock i/o, Alesis BRC or M-Audio ProFire Lightbridge, you can use an additional BNC-T piece to terminate the input. Plug the T piece with its center connector into the input of the receiving device. Then, connect the cable coming from the MC-7's Word Clock output to one of the lateral connectors, and the other connector of the BNC-T piece to a 75Ω resistor forming the BNC termination.

Basically, you should avoid »looping through« Word Clock leads by means of passive BNC-T pieces to preserve the signal quality, as level drops will be the result. If there is no other way to wire your set-up, please make sure that all Word Clock inputs (except for the last device in the chain) have their terminations disabled! In a serial Word Clock chain only the last clock input should have a termination! Never connect more than three devices in series to one output!

The condition of the packaging material and the device should be checked carefully additionally. If there are any damages please refer to SAFETY INSTRUCTIONS, Initial Operation, and WARRANTY REGULATIONS.



Before installing the unit the section **SAFETY INSTRUCTIONS** located at the beginning of this manual should be read carefully.



Never expose the device and accessories to rain, moisture, direct sunlight, or excessive heat produced by radiators, heaters, or spot lights! Sufficient air circulation in the environment of the device must be ensured!



It is imperative that the lengths of all cables connected are largely the same, as this is the only way to ensure that all devices will be synchronized in phase (exception: cable tolerances).

Please make sure that the cable used has a resistance of 75Ω , in compliance with the specifications! If a cable with a different resistance is used, a dramatic deterioration of the signal quality can be the result! In this case, the perfect synchronization of all devices involved could be impaired.

We recommend using high-grade cables with a good shielding. A length of max. 10 meters (approx. 30feet) should not be exceeded!

MUTEC offers optical cables of various lengths that have been specifically tested for the transmission of S/P-DIF signals. Ask your local dealer for those cables!

Since some manufacturers offer optimized cables for the transmission of digital S/P-DIF and AES/EBU audio signals, it will be a good idea to ask your retailer for specific cables.



Especially when working with high AES/EBU clock rates well shielded clock lines are imperative to avoid increased radiation! Standard cables are normally useable for clock rates up to 50.0kHz. Special shielded cable material should be used for transfer of higher clock rates.

MUTEC offers optical cables of various lengths that have been specifically tested for the transmission of S/P-DIF and ADAT™ signals (retailers and distributors only)!

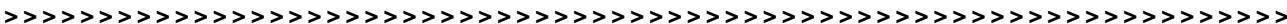
Wiring the AES/EBU and S/P-DIF Interfaces

Connect the AES/EBU interfaces with the help of balanced electrical cables equipped with XLR connectors on both ends. The specifications stipulate a specific cable resistance of 110Ω (ask your retailer for a confirmation of this value when purchasing the cables).

Connect the coaxial S/P-DIF interface with the help of unbalanced electrical cables equipped with cinch connectors on both ends. The specifications stipulate a specific cable resistance of 75Ω (ask your retailer for a confirmation of this value when purchasing the cables).

Connect the optical S/P-DIF interface with the help of Toshiba TOSLINK™ compliant optical fiber cables. Here, you can use both plastic and glass fiber-based cables. When using plastic fiber cables, lengths of 10 meters should not be exceeded, so as to ensure the reliable transmission of signals. Glass fiber cables can transfer data reliably even over greater distances.



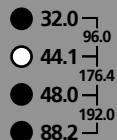




Locking so-called »Super Clocks«

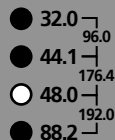
Your MC-7 is able to lock to so-called »Super Clock« (SCLK) reference signals. These clock signals are used preferably for older digidesign ProTools™ MX systems. Specified are only two clock rates, 11.2896MHz + 12.288MHz which are the x256 multiples of the Word Clock rates 44.1kHz and 48.0kHz.

When locking to one of these Super Clocks, the rate will be inverted displayed in the »REF CLOCK IN« menu. Due to this, the LED in front of the corresponding base clock rate, that means Word Clock rate, does not light while all other LEDs light (see examples below).



CLOCK IN

Super Clock of 44.1kHz Word Clock



CLOCK IN

Super Clock of 48.0kHz Word Clock

Differences between AES3 and AES11

Both standards, published by the Audio Engineering Society (AES), are based on the same interface, commonly called as AES/EBU interface which uses XLR connectors.

The AES3 standard carries both, the digital audio data and the reference clock information. The AES11, also known as 'blank frame signal', does not carry any digital audio data, but only the reference clock information for synchronization.

Word Clock as Input Reference including Options

<input checked="" type="radio"/> WCLK	<input type="radio"/> HOLD	x1	<input checked="" type="radio"/> 1	<input checked="" type="radio"/> 2	<input checked="" type="radio"/> 3	<input checked="" type="radio"/> 4	<input checked="" type="radio"/> 5	<input checked="" type="radio"/> 6
<input type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF co		x4	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
REFERENCE		CLK MULTIPLIERS						

This setting is the factory default and allows to input a Word Clock reference signal between 32.0kHz and 192.0kHz. Its clock rate will be displayed in the status menu »CLOCK IN«. The Word Clock reference signal will be internally regenerated and distributed phase-aligned to all eight Word Clock outputs. Simultaneously, the input signal will be converted into AES11 and S/P-DIF and output at the corresponding outputs. So, with one Word Clock reference signal you can synchronize various devices by Word Clock, AES11, S/P-DIF coaxial and S/P-DIF optical at the same time.

<input checked="" type="radio"/> WCLK	<input checked="" type="radio"/> HOLD	x1	<input checked="" type="radio"/> 1	<input checked="" type="radio"/> 2	<input checked="" type="radio"/> 3	<input checked="" type="radio"/> 4	<input checked="" type="radio"/> 5	<input checked="" type="radio"/> 6
<input type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF co		x4	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
REFERENCE		CLK MULTIPLIERS						

A special function can be added when pressing the SELECT key for a second time. This activates the »HOLD« function which leads to a fail-safe output of all outgoing signals. Interruptions within the input reference signal or even its total loss will not affect the continuous availability of all outgoing signals.

AES3/11 as Input Reference including Options

<input type="radio"/> WCLK	<input type="radio"/> HOLD	x1	<input checked="" type="radio"/> 1	<input checked="" type="radio"/> 2	<input checked="" type="radio"/> 3	<input checked="" type="radio"/> 4	<input checked="" type="radio"/> 5	<input checked="" type="radio"/> 6
<input checked="" type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF co		x4	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
REFERENCE		CLK MULTIPLIERS						

This setting allows to input an AES3 digital audio signal or an AES11 reference clock signal between 32.0kHz and 192.0kHz. Its clock rate will be displayed in the status menu »CLOCK IN«. The AES3/11 input signal will be regenerated and converted into Word Clock and S/P-DIF and transferred to the corresponding outputs simultaneously.

If an AES3 digital audio signal is feed in, it will be standardly output as AES11 reference clock signal. Similarly, the digital audio data will be not transferred to the S/P-DIF outputs, but only the clock reference data for synchronization purposes.

<input type="radio"/> WCLK	<input checked="" type="radio"/> HOLD	x1	<input checked="" type="radio"/> 1	<input checked="" type="radio"/> 2	<input checked="" type="radio"/> 3	<input checked="" type="radio"/> 4	<input checked="" type="radio"/> 5	<input checked="" type="radio"/> 6
<input checked="" type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF co		x4	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6
REFERENCE		CLK MULTIPLIERS						

There are two further function options available when feeding in an AES3 or AES11 signal: »HOLD« + »REF PASS«.

OPERATION

When pressing the SELECT key for a further time, you can activate the »HOLD« function which leads to a fail-safe output of all outgoing signals.

<input type="radio"/> WCLK	<input type="radio"/> HOLD	x1	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input checked="" type="radio"/> AES3/11	<input checked="" type="radio"/> REF PASS	x2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF co		x4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS						

When pressing the SELECT key again, you can activate the »REF PASS« function. This special function regenerates and transfers an AES3 input signal to the format-same output. In this case, the AES3/11 output transmits the original AES3 input signal incl. all digital audio data for further use within your studio set-up, while the other outputs supplying phase-aligned clock reference signals.

S/P-DIF coaxial as Input Reference including Options

<input type="radio"/> WCLK	<input type="radio"/> HOLD	x1	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> S/P-DIF co		x4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS						

This setting allows to input a S/P-DIF digital audio or blank frame signal between 32.0kHz and 192.0kHz at the coaxial input. Its clock rate will be displayed in the status menu »CLOCK IN«. The S/P-DIF input signal will be regenerated and converted into Word Clock, AES11 and S/P-DIF optical and transferred to the corresponding outputs simultaneously.

A S/P-DIF digital audio input signal will be standardly output as S/P-DIF blank frame signal for synchronization purposes at the coaxial and optical outputs. Similarly, the digital audio data will be not transferred to the AES3/11 output, but only the clock reference data.

<input type="radio"/> WCLK	<input checked="" type="radio"/> HOLD	x1	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> S/P-DIF co		x4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS						

There are also two further function options available when feeding in an S/P-DIF coaxial signal: »HOLD« + »REF PASS«.

When pressing the SELECT key for a further time, you can activate the »HOLD« function which leads to a fail-safe output of all outgoing signals.

<input type="radio"/> WCLK	<input type="radio"/> HOLD	x1	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/> AES3/11	<input checked="" type="radio"/> REF PASS	x2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> S/P-DIF co		x4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF op		x256	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS						

When pressing the SELECT key again, you can activate the »REF PASS« function. This special function regenerates and transfers a S/P-DIF coaxial input signal to the format-same output. In this case, the S/P-DIF output signal



AES3 + REF PASS

When feeding in an AES3 digital audio reference signal and using the REF PASS functionality, the digital audio signal will be only available at the format-same AES3 output. There will be no digital audio format conversion to the S/P-DIF outputs! The S/P-DIF outputs transmit blank frame signals only.*

While processing the AES3 signal, the PLL synthesizer circuit extracts the clock out of the AES3 signal, is re-generating it and is supplying it to all WCLK outputs. The WCLK output pairs can be multiplied individually by using the CLK Multipliers as mentioned at page 19.

*) If you need to convert the AES3 format into S/P-DIF, please use the MUTECH MC-1 or MC-1.1. These converters are especially made for AES3 to S/P-DIF, and vice versa, digital audio format conversion.



S/P-DIF coaxial + REF PASS

When feeding in a S/P-DIF coaxial digital audio reference signal and using the REF PASS functionality, the digital audio signal will be only available at the format-same S/P-DIF coaxial/optical outputs. There will be no digital audio format conversion to the AES3/11 output! The AES3/11 output transmits the AES11 blank frame signal only.*

While processing the S/P-DIF signal, the PLL synthesizer circuit extracts the clock out of the S/P-DIF signal, is re-generating it and is supplying it to all WCLK outputs. The WCLK output pairs can be multiplied individually by using the CLK Multipliers as mentioned at page 19.

*) If you need to convert the S/P-DIF format into AES3, please use the MUTECH MC-1 or MC-1.1. These converters are especially made for AES3 to S/P-DIF, and vice versa, digital audio format conversion.

		1	2	3	4	5	6
<input type="radio"/> WCLK	<input type="radio"/> HOLD	x1 <input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF co		x4 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> S/P-DIF op		x256 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS					

A S/P-DIF digital audio input signal will be standardly output as S/P-DIF blank frame signal for synchronization purposes at the optical and coaxial outputs. Similarly, the digital audio data will be not transferred to the AES3/11 output, but only the clock reference data.

		1	2	3	4	5	6
<input checked="" type="radio"/> WCLK	<input checked="" type="radio"/> HOLD	x1 <input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/> AES3/11	<input type="radio"/> REF PASS	x2 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF co		x4 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> S/P-DIF op		x256 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS					

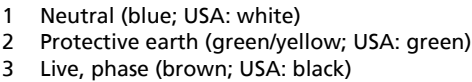
When pressing the SELECT key for a further time, you can activate the »HOLD« function which leads to a fail-safe output of all outgoing signals.

		1	2	3	4	5	6
<input type="radio"/> WCLK	<input type="radio"/> HOLD	x1 <input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/> AES3/11	<input checked="" type="radio"/> REF PASS	x2 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/> S/P-DIF co		x4 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> S/P-DIF op		x256 <input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
REFERENCE		CLK MULTIPLIERS					

[illegible]

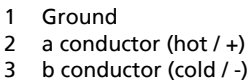


Mains

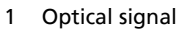


1	Signal
2	Ground

1 Audio ground
2 a conductor (hot / +)
3 b conductor (cold / -)



1 Audio signal
2 Audio ground



CAUTION! Disconnect the unit from the mains before opening!
Remount the aluminium cover thoroughly before you attempt to operate the unit!

Jumper:





WORD CLOCK SIGNAL AS INPUT REFERENCE

WORD CLOCK SIGNAL AS INPUT REFERENCE + HOLD FUNCTION

AES3 DIGITAL AUDIO SIGNAL AS INPUT REFERENCE

AES3 DIGITAL AUDIO SIGNAL AS INPUT REFERENCE + HOLD FUNCTION

AES3 DIGITAL AUDIO SIGNAL AS INPUT REFERENCE + REF PASS FUNCTION

AES11 BLANK FRAME SIGNAL AS INPUT REFERENCE

[illegible]

AES11 BLANK FRAME SIGNAL AS INPUT REFERENCE + HOLD FUNCTION					
Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x 256	Output Signal
1: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	88.2kHz	176.4kHz	None	AES11, blank frame, none audio
6: S/P-DIF op+co	44.1kHz	88.2kHz	176.4kHz	None	S/P-DIF blank frame, none audio

Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x256	Output Signal
1: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	None	None	None	AES11, blank frame, none audio
6: S/P-DIF op+co	44.1kHz	None	None	None	S/P-DIF blank frame, none audio

Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x256	Output Signal
1: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	88.2kHz	176.4kHz	None	AES11, blank frame, none audio
6: S/P-DIF op+co	44.1kHz	88.2kHz	176.4kHz	None	S/P-DIF blank frame, none audio

Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x256	Output Signal
1: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	88.2kHz	176.4kHz	None	AES11, blank frame, none audio
6: S/P-DIF op+co	44.1kHz	88.2kHz	176.4kHz	None	S/P-DIF blank frame, none audio

Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x 256	Output Signal
1: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	None	None	None	AES11, blank frame, none audio
6: S/P-DIF op + co	44.1kHz	None	None	None	S/P-DIF digital audio signal *

Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x 256	Output Signal
1: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A + B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	88.2kHz	176.4kHz	None	AES11, blank frame, none audio
6: S/P-DIF op + co	44.1kHz	88.2kHz	176.4kHz	None	S/P-DIF blank frame, none audio

S/P-DIF OPTICAL DIGITAL AUDIO SIGNAL AS INPUT REFERENCE + HOLD FUNCTION					
Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x 256	Output Signal
1: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	88.2kHz	176.4kHz	None	AES11, blank frame, none audio
6: S/P-DIF op +co	44.1kHz	88.2kHz	176.4kHz	None	S/P-DIF blank frame, none audio

S/P-DIF OPTICAL DIGITAL AUDIO SIGNAL AS INPUT REFERENCE + REF PASS FUNCTION					
Outputs	Multiply x 1	Multiply x 2	Multiply x 4	Multiply x 256	Output Signal
1: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
2: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
3: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
4: Word Clock, A+B	44.1kHz	88.2kHz	176.4kHz	Super Clock	Clock Signal
5: AES3/11	44.1kHz	None	None	None	AES11, blank frame, none audio
6: S/P-DIF op+co	44.1kHz	None	None	None	S/P-DIF digital audio signal *

*) Both S/P-DIF outputs are supplying the same digital audio signal with same content, but electrically converted into a coaxial and an optical signal.

[illegible]



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FON 0049-(0)30-74 68 80-0
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